

1      ABSTRACT OF THE DISCLOSURE

2      A method of forming a thin film transistor relative to a substrate  
3      includes, a) providing a thin film transistor layer of polycrystalline  
4      material on a substrate, the polycrystalline material comprising grain  
5      boundaries; b) providing a fluorine containing layer adjacent the  
6      polycrystalline thin film layer; c) annealing the fluorine containing layer  
7      at a temperature and for a time period which in combination are  
8      effective to drive fluorine from the fluorine containing layer into the  
9      polycrystalline thin film layer and incorporate fluorine within the grain  
10     boundaries to passivate said grain boundaries; and d) providing a  
11     transistor gate operatively adjacent the thin film transistor layer. The  
12     thin film transistor can be fabricated to be bottom gated or top gated.  
13     A buffering layer can be provided intermediate the thin film transistor  
14     layer and the fluorine containing layer, with the buffering layer being  
15     transmissive of fluorine from the fluorine containing layer during the  
16     annealing. Preferably, the annealing temperature is both sufficiently high  
17     to drive fluorine from the fluorine containing layer into the  
18     polycrystalline thin film layer and incorporate fluorine within the grain  
19     boundaries to passivate said grain boundaries, but sufficiently low to  
20     prevent chemical reaction of the fluorine containing layer with the  
21     polycrystalline thin film layer.